



Hybrid Optical Parametric Amplifier (OPA) STAR-H



2023 V1

For customized projects please Contact us:

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STAR-H is a hybrid optical parametric amplifier (OPA) that combines the short pulse duration produced by a non-collinear OPA (NOPA) with the broad tuning range provided by a collinear OPA. This gives it unique performance advantages, allowing its signal light to be tuned in the range of 650-900nm, while the idler light can be tuned in the range of 1200-2500nm, and pulse compression down to 50-100 fs pulse duration can be achieved with dispersion compensation.

STAR-H is compatible with a variety of market-standard fiber and solid-state Yb ultrafast lasers, and supports one-click precise tuning, allowing customers to easily obtain the desired central wavelength output without the need for complex manual adjustments. This not only greatly facilitates customers but also enhances their work efficiency.

Features

- Compatible with 80W, 10-500uJ pump input
- Tuning range from 210nm to 10μm
- Supports pulse widths as short as <50fs
- High output stability
- CEP stability options
- Electro-mechanical integrated design

Applications

- Transient absorption spectroscopy
- Nonlinear optics
- Two-dimensional infrared spectroscopy
- Fluorescence spectroscopy
- Sum-frequency spectroscopy
- Stimulated raman scattering
- High harmonics and X-ray sources
- Attosecond science

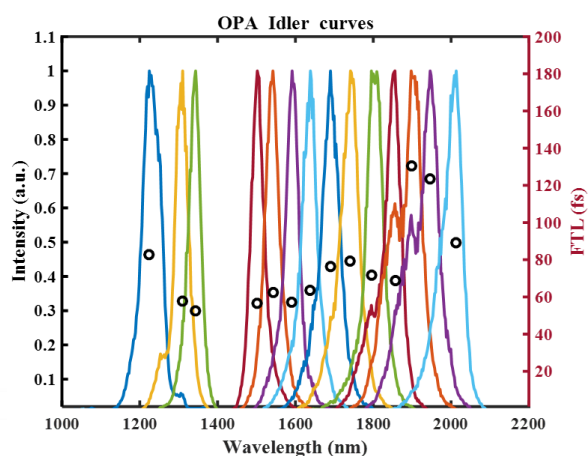
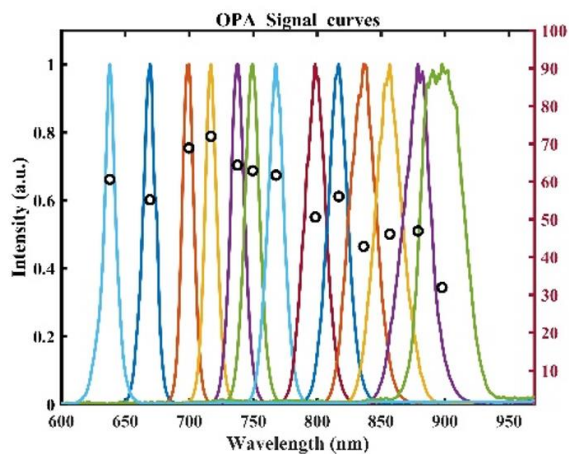


Specifications

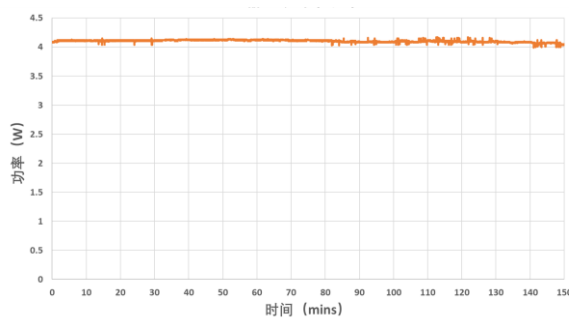
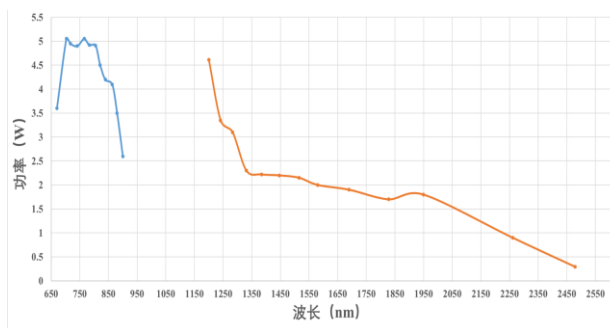
Model	STAR-H	STAR-H-HP	STAR-H-HE
Tuning Range	650 – 900 nm (Signal light) 1200 – 2600 nm (Idler light)		
Maximum Pump Power	80 W		
Maximum Pump Energy	10 – 20μJ	20-200μJ	200-2000μJ
Peak Conversion Efficiency	> 10% (Signal light+Idler light)		
Second Harmonic (515 nm) Conversion Efficiency	> 40 %		
Spectral Bandwidth	200 – 750 cm ⁻¹ @ 650 – 900 nm		
Compressed Pulse Width	< 55 fs @ 800 – 900 nm		
	< 70 fs @ 650 – 800 nm		
	< 100 fs @ 1200 – 2000 nm		
Compressor Transmission Efficiency	> 65% @ 650 – 900 nm		
	> 80% @ 1200 – 2000 nm		
Long-Term Power Stability	< 1.5% @ 750 nm@ 8h		
Pulse Energy Stability	< 1.5% @ 750 nm		

In the short-pulse mode, broadband pulses are externally compressed, with a typical pulse duration of 120 - 250 fs before ytterbium-rhenium compression.

Test Data

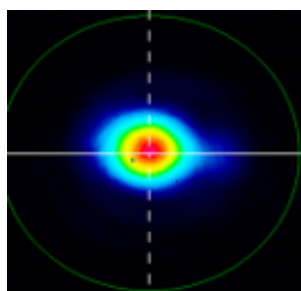


Spectral Bandwidth of Signal and Idler Light Recorded during STAR-H In-Field Testing

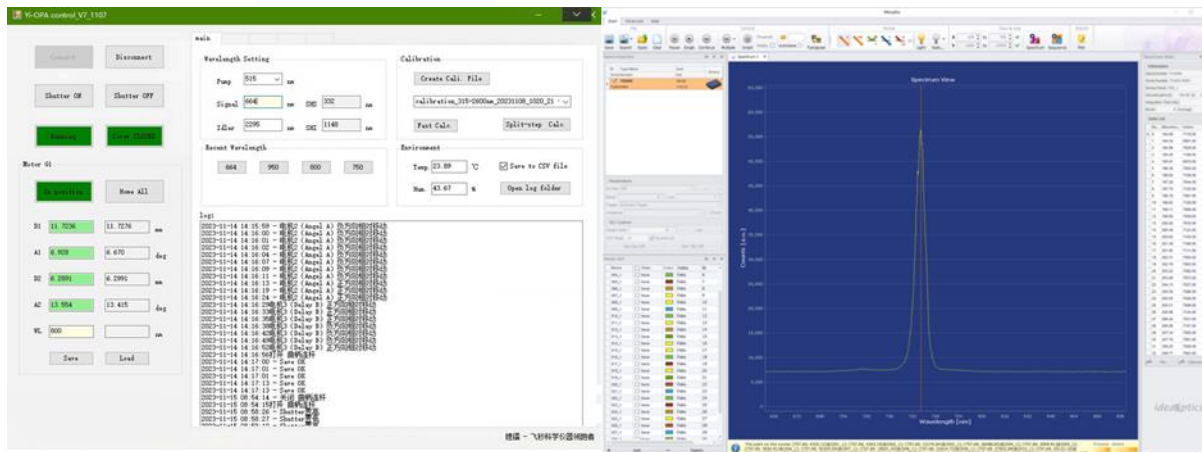


OPA Output Power @1MHz
(Output power in the 850-900nm and 1200-1300nm wavelength ranges is for reference only.)

OPA Output Power Stability (780nm @ 150mins)
RMS=0.16% between 30-80 minutes, with power fluctuations attributed to laser beam pointing jitter.



Beam Quality



STAR-H Software Interface (Wavelength Tuning Precision up to ± 1 nm)

Mechanical Drawings

